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ABSTRACT

These guidelines are designed to give preservice teachers information to use in selecting techniques and planning learning experiences for young children in the microcomputer laboratory. The main purpose of this laboratory experience is for children to develop computer awareness/literacy and keyboard knowledge, and to improve skills in following directions. A list of 22 computer terms is given as an aid in developing computer literacy. Computer techniques used with young children include computer-assisted instruction (drill and practice, tutorial, and simulation) and programming. Twenty-one computer programs for young children are very briefly described in terms of their subject matter and educational goals (availability information is not provided). Steps are given for planning the use of the computer center. Guidelines conclude with suggestions on ways to use computers with young children and a list of more than 30 activities to teach children about computers and their function in society. (CB)

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MICROCOMPUTERS FOR YOUNG CHILDREN

Procedures and Practices in the Laboratory Classroom

Kindergarten Endorsement Program
School of Education
Baylor University
Waco, Texas

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Preface

The value of the microcomputer in education continues to be discussed and explored. Educators are exploring techniques and research continues as to the role of the microcomputer in the learning environment.of the young child. Young children of today are living in a society of technology and technological change. They are interested, curious and less inhibited thar the adult in using the microcomputer.

The first step in using the microcomputer with young children is teacher preparation. The teacher needs to understand how a microcomputer works, how children work with a microcomputer and how to plan and incorporate a microcomputer in the learning environment. The following guidelines are designed to give preservice teachers information in selecting techniques, and planning.learning experiences for young children. The preservice teacher must plan time for hands on experience in the computer laboratory.

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MICRO COMPUTERS FOR YOUNG CHILDREN

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Introduction

Children of today are living in a society of technology and technological change. Computer technology is increasingly becoming a part of everyday life and the learning environment. Teachers need to become aware of the functions of the microcomputer, the capabilities of the technology with young children and the response of young children to this tool and instructional technique. The microcomputer will not replace the teacher but it does present another tool for effective and efficient teaching.

Many parents are interested that young children have experiences with microcomputers while others feel that early experiences are not necessary. Educators are exploring techniques and research continues as to the role of the computer for the young child. The young child continues to be interested, curious and less inhibited than adults in using the microcomputer.

This laboratory experience is designed to give the preservice teacher an opportunity to have hands on experiences with the microcomputer and to develop techniques of using the microcomputer in the learning environment of young children. The main purpose of this experience is for the children to develop computer awareness and literacy, keyboard knowledge and to improve skills in following directions.

Computer Awareness

The young child should become aware of the computer and how it is a part of the environment. Both teacher and child need to recognize that they are in control and not the computer.

How the computer can function, the many uses of a computer and the appropriate care of the terminal and software should be the first step in using the computer with young children.

Computer Literacy

While there is no concensus as to what constitutes computer literacy it is the major goal in the use of the microcomputer with young children. Learning the function of the computer and how to operate the computer is usually the first step. Developing a vocabulary of computer terms excites the learner as well as using the computer as a tool, a tutor to provide instruction and a tutee to be programmed.

These terms will assist in developing vocabulary.

BASIC -- BASIC is an easy programming language. It stands for Beginners All-Purpose Symbolic Instruction Code. Many computers use the BASIC language.

computer - A computer is a machine with a memory which accepts information to solve a problem, and puts out the answer.

cursor - A cursor is a symbol on a computer screen. On some computers, a cursor is a lighted square which can be moved around to tell where the next letter or number will appear.

data - Data is the information that a computer needs to solve a problem.

disk - A disk is a shortened name for magnetic disk or a floppy diskette.

disk drive - A disk drive is a machine which is used with large and small computers. A magnetic disk is placed in the disk drive. The computer can then save and use information on the magnetic disk.

diskette - A diskette is a small magnetic disk. It may be used with a microcomputer to store information. Diskette is a shortened name for floppy diskette or mini-floppy diskette.

END - END is a statement in a computer program which usually has the highest statement number. It tells the computer it has reached the end of the program.

flowchart - A flowchart is a drawing or map that tells the steps needed to solve a problem. It also shows the correct order for doing the steps. A computer program may be written from the flowchart.

graphics - Graphics are pictures, charts, and special letters drawn by a computer. Graphics might be in color and they may move. Computer graphics may be seen on a TV screen or printed on a printer.

hardware - Hardware is the computer machinery. A tape reader is a piece of hardware.

information retrieval - Information retrieval means that the information that is stored in a computer can be gotten (retrieved) from the computer's memory. Names and addresses may be stored in a computer's memory. A person may direct the computer to retrieve this information and print it on address labels.

input - Input is the information that goes into the computer, A person may input the information into the computer by typing it on a keyboard.

keyboard - A keyboard can be used to type information into a computer. A keyboard has many keys with letters, numbers, and symbols on them. Many computer keyboards are similiar to typewriter keyboards.

log in - To log-in means to sign in on a computer. To do this, a special codeword is used. A person must log-in on some computers before the computer will talk to you.

microcomputer - A microcomputer is a small computer. It usually has a keyboard like a typewriter and is often about the same size as a typewriter. Microcomputers are used today in homes and schools because they are small and cost less than larger computers.

output - The output from a computer is the information the computer sends out. It may be the answer to the problem or it may be the problem itself. The output may be seen on a TV screen or printed on a printer.

printer - A printer is a machine that prints on paper the information (output) that comes from a computer.

program - A program is a set of instructions which tells the computer what to do. There are many different languages used to program computers.

programmer - A programmer is a person who writes a computer program. A programmer uses a special language the computer understands.

software - Programs and data that go into the computer are known as software. A programmer writes software for a computer.

terminal - A terminal is a machine with a keyboard like a typewriter. It is sometimes connected to a computer over telephone lines.

<u>My Computer Dictionary</u> by
Rice and Haley

Computer Techniques

The most used technique with the microcomputer and young children is computer assisted instruction. This technique can be used in three ways: drill and practice, tutorial and simulation.

Drill and practice: This technique offers an opportunity to improve skills already learned. Software is available in pre-reading, early reading and mathematics. Most programs on the market for young children fall in this category.

Tutorial: This technique gives a sequence of information with an activity about the content.

Simulation: This technique describes a situation and the child must act on the situation.

Tutorial and simulation require more teacher direction while drill and practice can be an independent activity after the child masters the keyboard and following directions.

The following programs are suggested for computer assisted instruction:

Software/Title	Index	Subject/Level	Description
(1) Spelling Bee With Reading Primer	A7	Early Childhood Lang Arts	Guide-Teaches Basic Reading and Spelling concepts.
(2) Counting Bee	A8	Early Childhood Math	Introduces Basic Numeric & Quantitative Concepts to children in K-3
(3) Preschool IQ Builder-32K	A9	Early Childhood Lang Arts	Helps 3-6 year olds devl. critical skills that will be used when they start school.
(4) Clock	A1[illegible]	Early Childhood Math	A program to help students learn to tell time (A reg. clock face is used)
(5) Counting Programs	A14	Early Chiodhood Math	Child locates numerals on the keyboards.
(6) Early Elem. I	A15	Early Childhood Misc.	Teaches the child to recognize various colors-shapes and numerals
(7) Letter number and concept-Formation	A16	Early Childhood Misc.	Matching Lower & Upper Case Letters Supplying Missing Letters or Numerals
(8) Early Words	A17	Early Childhood La. Arts	Helps develop a sight-Voc of names, colors and familiar objects
(9) Gettin Ready to Read and Add	A18	Early Childhood Misc.	Include reading readiness activities-Memory Games-and counting practice

	Subject/Title	Index	Subject/Level	Description
(10)	Working with the Alphabet (cassette)	C45	Early Childhood La. Arts	Child puts words in alphabetical order
(11)	Getting Ready to Read & Add	A51	Early Childhood Misc.	Upper & Lower case letters- Initial Letter recog - Memory Games
(12)	Hodge Podge	A53	Early Childhood	A learning device which provides knowledge in a non-threatening way
(13)	Alphabet Soup (cassette)	C58	Early Childhood La. Arts	Alphabet reviewed-Guide
(14)	Juggles' Rainbow	A79	Early Childhood La. Arts	A set of programs that help children learn pre-reading concepts ages 3-6
(15)	Kinder Comp	C82	Early Childhood Misc.	Practice recog letters-Names- and patterns ages 3-8
(16)	Letter Recognition	A12	Lang. Arts (K-1)	Exercises in recog & Matching upper & lower case letters Num. words & numbers
(17)	Sticybear Numbers	A106	Early Childhood	Counting Activities
(18)	Micro Mother Goose	A107	Early Childhood	Mother Goose Rhymes with Music

Computer assisted instruction offers an opportunity for the young child to become familiar with hardware, keyboard, terminology, software and enhance problem solving skills. The child receives feedback, follows directions, works independently and can share ideas with others. Activities can be self-paced because the computer is patient and waits for a response.

Programming

Seymore Papert in his book Mindstorms: Children, Computers, and Powerful Ideas cautions that computer aided instruction means making the computer teach the child and the relationship should be reversed. The child should program the computer.

Teaching young children to give the computer instructions not only promotes computer literacy but provides opportunities for thinking and reasoning. Programming can offer appropriate opportunities with children who have had experience with a microcomputer and children who need more challenging activity. The teacher and child can work together to write programs and program the computer.

The following are for simple programming:

LOGO - Developed by Papert, offers an opportunity for children to move shapes on the screen in response to directions.

Hodge Podge - Developed by Marsha Meredith and produced by DYNA Company, can be used with very young children. Songs can be written with numerals and patterns can be developed.

Delta Draw - Children are given an opportunity to draw shapes and designs giving commands to the computer.

The manual for the different microcomputers will give programming directions.

Planning for the Computer Center

The purpose of this center is to develop computer awareness, computer literacy, keyboard skills and following directions. Planning is an important step in developing the role of the computer in the learning environment of the young child.

Steps to Follow in Planning:

I. Computer Awareness

Introduce children to the microcomputer. Find out what experiences they have had with a computer. Guide the children into the knowledge that a computer can help them, how a computer functions and the care of a computer.

II. Computer Literacy

Introduce termonology and keyboard experiences. Review this procedure each week.

III. Select techniques to be used for the session.
Select software carefully. Be sure to preview software and know how to work with the program and activity before presenting it to the children.

IV. Write a teaching plan for each activity. Know the objective for the activity and the techniques involved.
Outline for the Teaching Plan:

A. Name of Program or Activity.
B. Objectives
C. Procedure
D. Evaluation

V. Evaluate and record each child's progress. Keep a list of what the child has accomplished and computer assisted programs and the skills developed. Give children an opportunity to share ideas with each other.

Helpful Hints

- Develop a positive attitude about the computer. Remember this is a tool for learning.
- Know your computer terminal. Read and follow directions carefully.
- Know the care of the computer terminal and software.
- Learn computer terminology.
- Provide time for hands on experience before you work with a child,
- Select the technique of instruction with the microcomputer.
- Select software with care and review software before using with children. Software must be compatable with the terminal.
- Every program is not for every child. Remember to individualize.
- Identify your objective for each activity with the children.
- Plan each learning experience with the microcomputer.
- Evaluate the progress of yourself and the child.

Activities

- Make a survey of childrens' experiences with the computer. Record this information on a chart or in a book.
- Take a trip to a computer store and see the different computers and software. Write an experience story about the trip. Draw a mural of the trip and the computer store.
- Take a trip to businesses, a computer science department or other places where computers are used.
- Discover how computers help us each day. Have the child make a book about the many uses of the computer in their daily life.
- Suggest children look for computers or information about computers in places other than the computer center. Invite them to share their findings.
- Encourage children to look in magazine and newspapers and bring pictures of computers for bulletin boards or collage.
- Make a poster about the care of a computer.
- Read about computers in the encyclopedia. Compare the early computer with the computer of today.
- Introduce computer terms. Include computer, microcomputer, terminal, cursor, disk drive, diskette, input, output, keyboard, monitor, hardware, software, program, programmer.
- Make keyboards from poster board for the children in identifying letters, numbers and other keys used in computer assisted instruction or programming.
- Provide a typewriter for children to develop keyboard skills and letter recognition.

- Make card games of computer parts and terms for identification, matching and following directions.
- Make a sorting game of computer parts and other electronic aids. Instruct the children to find the pictures that "go together."
- Select computer assisted programs for the children. Explain the procedure to work with the programs. Prepare a sequence chart of the steps to follow when using a program.
- Select programs in developing or reinforcing mathematics, pre-reading or reading skills.
- Follow up by discussion with the child to evaluate progress.
- Allow children to work with partners or in small teams with computer assisted instructions.
- Select programs for children to use independently with drill and practice.
- Make a scrap book for the library center identifying the many uses of the computer.
- Make available computer catalogues in the art center for children to use in collage or to construct mobiles.
- Encourage following directions by making a step-by-step chart of how to prepare the computer to work with a program.
- Arrange a demonstration with a printer.
- Demonstrate the techniques of simple programming.
- Allow the children to observe while the teacher programs the computer.
- Provide an opportunity to write a program. Then program the computer. (LOGO, Delta Draw or the manual for your computer may be used.)
- Play a game with the children being the cursor and following directions. Example: Take two steps forward, turn right and take two steps.
- Write songs with the use of numerals from the program, Hodge Podge (Meredith, 1981).
- Draw shapes and patterns with LOGO or Delta Draw. Have the children copy the patterns with paper and crayon, geo-board, peg board, an "Etch a Sketch," "Light Bright" or with small blocks.
- Design patterns on geo-board, peg board, "Etch a Sketch" or draw patterns on paper.
- Draw pictures of a computer and make a display.
- Provide social experiences by providing a time for children to discuss their activities and their learning.
- Use simple programming techniques with Delta Draw to program the computer.

Resources

- Bulletin Board Aids
  Computer Care
  Computers Help Us
  Meet the Computer
  Frank Schaffer Publications, Inc.
  Torrance, California 90502

- The Micrcomputer as a Teaching Tool
  Filmstrip/Software Package
  Society for Visual Education Inc.
  Department VB
  1345 Diversey Parkway, Chicago, Illinois 60614

- Kids Working With Computers by
  Lynne Mass
  Trilluim Press

- Buckfang's LOGO Challenge: Shapes and Angels by
  Thomas Kemnity
  Trilluim Press

- Computers for Kids by
  Sally Greenwood Larsen
  Creative Computing Press

- My Friend - The Computer by
  Jean Rice
  T.S. Denison and Company, Inc.

- My Computer Picture Dictionary by
  Jean Rice and Marien Haley
  T.S. Denison and Company, Inc.

- The Educational Computer Software Catalog, 1984 First Edition
  National Education Association
  1201 16th St. NW
  Washington, D.C. 20036

- Hodge Podge by
  Marsha Meredith
  DYNA Company

- Delta Draw

- LOGO
  Terrapin, Inc.

- Computers Are Fun by
  Sandy O'Conor
  T.S. Denison and Company, Inc.

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